

# 2013 EPA AMMONIA CRITERIA

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Utah Division of Water Quality  
Water Quality Standards Workgroup  
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# A Brief History of Ammonia Criteria

- 1976: Original criteria
- 1985: Revised criteria for unionized ammonia ( $\text{NH}_3$ )
- 1999: Revised criteria for total ammonia ( $\text{NH}_3$  &  $\text{NH}_4^+$ )
  - Acute based on salmonid fish; pH dependent
  - Chronic based on bluegill sunfish early life stage; pH and temperature dependent
- 2004: Utah adopted 1999 criteria; no chronic criteria for 3C/3D waters
- 2009: Utah adopted 1999 chronic criteria for 3C/3D waters
- 2009: EPA proposed revised criteria
  - Acute & chronic based on mussels and gill-breathing snails
- 2013: Revised criteria
  - Acute & chronic based on mussels and gill-breathing snails



# Frequency and Duration

- No changes from 1999 to 2013
- Frequency
  - Not to be exceeded more than once in three years on average
- Duration
  - Acute: 1-hour average
  - Chronic: 30-day average
    - Also not to exceed 2.5 times the criterion continuous concentration as a 4-day average within a 30-day period



# Acute Criteria Comparison

(1-hour Ave mg/L)

Temperature (deg C)	pH	2013		1999		Difference (1999-2013)			
		Salmonids		Salmonids		Salmonids Present		Salmonids Absent	
		Present	Absent	Present	Absent	mg/L	%	mg/L	%
30	9.0	0.27	0.27	0.88	1.32	-0.62	-69.7%	-1.06	-79.7%
30	8.5	0.65	0.65	2.14	3.20	-1.49	-69.6%	-2.55	-79.7%
30	8.0	1.70	1.70	5.62	8.41	-3.91	-69.6%	-6.70	-79.7%
30	7.5	4.03	4.03	13.28	19.89	-9.25	-69.6%	-15.86	-79.7%
30	7.0	7.32	7.32	24.10	36.09	-16.79	-69.6%	-28.78	-79.7%
30	6.5	9.90	9.90	32.61	48.83	-22.71	-69.6%	-38.93	-79.7%
20	9.0	0.62	0.62	0.88	1.32	-0.27	-30.5%	-0.71	-53.5%
20	8.5	1.49	1.49	2.14	3.20	-0.65	-30.5%	-1.72	-53.6%
20	8.0	3.90	3.90	5.62	8.41	-1.71	-30.5%	-4.50	-53.6%
20	7.5	9.24	9.24	13.28	19.89	-4.05	-30.5%	-10.65	-53.6%
20	7.0	16.76	16.76	24.10	36.09	-7.34	-30.5%	-19.33	-53.6%
20	6.5	22.67	22.67	32.61	48.83	-9.93	-30.5%	-26.15	-53.6%
10	9.0	0.88	1.38	0.88	1.32	0.00	0.0%	0.06	4.3%
10	8.5	2.14	3.34	2.14	3.20	0.00	0.0%	0.14	4.3%
10	8.0	5.61	8.77	5.62	8.41	0.00	0.0%	0.36	4.3%
10	7.5	13.28	20.75	13.28	19.89	0.00	0.0%	0.86	4.3%
10	7.0	24.10	37.65	24.10	36.09	0.00	0.0%	1.55	4.3%
10	6.5	32.60	50.93	32.61	48.83	0.00	0.0%	2.10	4.3%
5	9.0	0.88	1.38	0.88	1.32	0.00	0.0%	0.06	4.3%
5	8.5	2.14	3.34	2.14	3.20	0.00	0.0%	0.14	4.3%
5	8.0	5.61	8.77	5.62	8.41	0.00	0.0%	0.36	4.3%
5	7.5	13.28	20.75	13.28	19.89	0.00	0.0%	0.86	4.3%
5	7.0	24.10	37.65	24.10	36.09	0.00	0.0%	1.55	4.3%
5	6.5	32.60	50.93	32.61	48.83	0.00	0.0%	2.10	4.3%



# Chronic Criteria Comparison

(30-day Ave mg/L)

Temperature (deg C)	pH	2013 Mussels Present 30-day Ave mg/L	1999 Fish Early Life Stages 30-day Ave mg/L		Difference (1999-2013)				
			All Life Stages	Present	Absent	Fish ELS Present		Fish ELS Absent	
						mg/L	%	mg/L	%
30	9.0	0.08	0.18	0.18	-0.10	-54.5%	-0.10	-54.5%	
30	8.5	0.18	0.40	0.40	-0.22	-54.5%	-0.22	-54.5%	
30	8.0	0.41	0.90	0.90	-0.49	-54.5%	-0.49	-54.5%	
30	7.5	0.73	1.61	1.61	-0.88	-54.5%	-0.88	-54.5%	
30	7.0	0.99	2.18	2.18	-1.19	-54.5%	-1.19	-54.5%	
30	6.5	1.12	2.46	2.46	-1.34	-54.5%	-1.34	-54.5%	
20	9.0	0.16	0.34	0.34	-0.19	-54.5%	-0.19	-54.5%	
20	8.5	0.35	0.76	0.76	-0.42	-54.5%	-0.42	-54.5%	
20	8.0	0.78	1.71	1.71	-0.93	-54.5%	-0.93	-54.5%	
20	7.5	1.39	3.06	3.06	-1.67	-54.5%	-1.67	-54.5%	
20	7.0	1.89	4.15	4.15	-2.26	-54.5%	-2.26	-54.5%	
20	6.5	2.13	4.68	4.68	-2.55	-54.5%	-2.55	-54.5%	
10	9.0	0.30	0.49	0.65	-0.19	-39.2%	-0.35	-54.5%	
10	8.5	0.66	1.09	1.46	-0.43	-39.2%	-0.79	-54.5%	
10	8.0	1.48	2.43	3.26	-0.95	-39.2%	-1.78	-54.5%	
10	7.5	2.66	4.36	5.84	-1.71	-39.2%	-3.18	-54.5%	
10	7.0	3.60	5.91	7.91	-2.31	-39.2%	-4.31	-54.5%	
10	6.5	4.06	6.67	8.92	-2.61	-39.2%	-4.86	-54.5%	
5	9.0	0.36	0.49	0.79	-0.13	-26.2%	-0.43	-54.5%	
5	8.5	0.80	1.09	1.77	-0.29	-26.2%	-0.96	-54.5%	
5	8.0	1.80	2.43	3.95	-0.64	-26.2%	-2.15	-54.5%	
5	7.5	3.22	4.36	7.09	-1.14	-26.2%	-3.86	-54.5%	
5	7.0	4.36	5.91	9.60	-1.55	-26.2%	-5.23	-54.5%	
5	6.5	4.92	6.67	10.82	-1.74	-26.2%	-5.90	-54.5%	



# Flexibility in Implementation

- Recalculation procedure for regional/site-specific criteria
  - Delete species that are absent or not representative
- Variances
  - Utah variance policy currently under development
- Revisions to designated uses
  - Based on Use Attainability Analysis (UAA)
- Dilution allowances
  - Utah has an adopted mixing zone policy
- Compliance schedules
  - Utah allows compliance schedules for meeting revised criteria



# Flexibility in Implementation

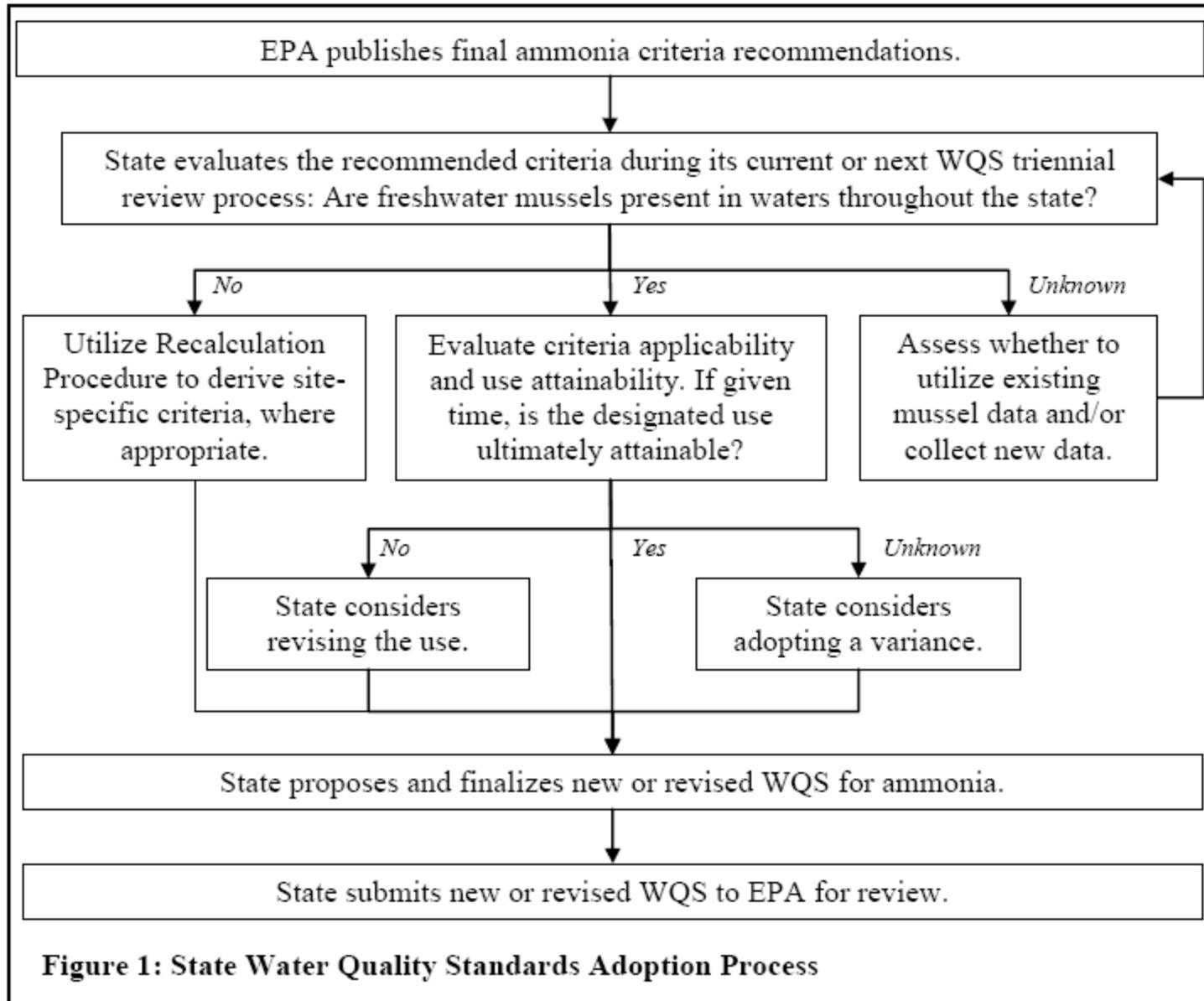


Figure 1: State Water Quality Standards Adoption Process



# Recalculation Procedure

- Used to derive regional or site specific criteria
- Where a state can demonstrate that mussels are not present on a site-specific basis, the Recalculation Procedure may be used to remove the mussel species from the National Criteria dataset
- Delete test species not present at the site or not representative of species at the site, i.e. mussels
- Need to determine species present at the site
  - More straightforward to establish presence than absence
  - Presence includes species that were present at the site in the past, but are not currently present due to degraded and are expected to return to the site when conditions improve
- DWQ considering commissioning a study to evaluate regional presence/absence of mussels and non-pulmonate snails
- EPA has developed a spreadsheet to assist with the recalculation of the criteria



# Summary

- DWQ to evaluate adopting criteria during next triennial review
- DWQ considering commissioning study to evaluate statewide presence/absence of mussels and non-pulmonate snails in support of regional or site-specific criteria development through the Recalculation Procedure
- DWQ planning to adopt a variance policy
- DWQ evaluating the potential implications for POTWs currently planning facility upgrades/expansions

